

collecting **CURIOUS CARNIVORES**

With his life list of Madagascar's endemic carnivores almost complete, Nick Garbutt ventured to the far reaches of the island to find the one species that eluded him. This being Madagascar, though, his quest held more than a few surprises.

TEXT & PHOTOGRAPHS BY NICK GARBUTT

Missing pieces in collections are annoying. They niggle and gnaw at the subconscious, a constant reminder of unfinished business. As a kid I became obsessed with WWF endangered species cards from Shell garages. There were 50 to collect and my grandparents weren't allowed to buy their petrol from any other filling stations until I'd got the lot. I amassed countless repeats of tigers or gorillas or whatever, but it seemed to take forever to get the last one, number 50 of 50, the aye-aye from Madagascar.

Fast-forward 35 years and I was back in the same position, fretting about an elusive element from a collection in Madagascar. But this time it was a real animal from a real place. I've been visiting the island on and off for 18 years and through a combination of persistence, perseverance and pure good fortune I've seen the majority of its endemic carnivores, all bar one, in fact. And that really irked me. The culprit was a little beast called Grandidier's mongoose, which had eluded the scientific community until 1986 when it was first described. What made the situation all the more frustrating was that I knew exactly where to find it, but for a long time I simply couldn't get there.

Grandidier's mongoose *Galidictis grandidieri*, the giant striped mongoose or, to use its Malagasy name (now the preferred vernacular), Grandidier's vontsira-fotsy, is nocturnal and known only from a small region on the western edge of the Mahafaly Plateau adjacent to Lac Tsimanampetsotsa in Madagascar's extreme south-west. However, for many years this area has been off-limits to all except the bone fide scientific community and official personnel. The situation changed more recently when the area became Lac Tsimanampetsotsa National Park, opening the way for regular tourism and wildlife watching. So finally in October 2009 I got the chance to try to track down one of the island's least known mammals. ►



ABOVE After spending the day in a rock cavity or burrow, Granddier's mongoose (Granddier's vontsira-fotsy) emerges only after dark.

OPPOSITE The spiny bush vegetation that covers the Mahafaly Plateau is both bizarre and extreme, and is epitomised by this *Adansonia rubrostipa* baobab, which is reputedly more than 3 000 years old.

PREVIOUS SPREAD Virtually nothing is known about the behaviour and ecology of Granddier's mongoose. It is thought to forage either singly or in pairs amongst the jagged limestone of the Mahafaly Plateau to the east of Lac Tsimanampetsotsa.

A combination of plane, boat, 4x4 and ox cart, over three days, took me from Madagascar's capital Antananarivo to a campsite on the north-east corner of the lake. I arrived in the mid-morning, so had plenty of time to scope the area before nightfall, when the mongooses would be active. The campsite spread through a small grove of tamarind trees, with the edge and lower slopes of the apparently laser-straight limestone ridge immediately behind it. In the depression below the escarpment a finger-like sliver of azure lake stretched southwards into the distance.

Picking over sharp-edged chunks of limestone, I worked my way up the trail behind the campsite and onto the top of the Mahafaly Plateau, perhaps 15 to 20 metres above the lake. Surrounding me was quite the most bizarre-looking habitat I have ever seen: a potpourri of spindly bushes with needle spines, towering succulents with bulbous trunks and rotund baobabs with dark terra-cotta bark, peeling as if afflicted by

horrific sunburn. One of these baobabs, of the species *Adansonia rubrostipa*, was particularly impressive. With a girth in excess of 20 metres, its great bottle trunk was folded into grotesque shapes ▶



[this tree] was seeded when the Phoenicians were inventing the alphabet, and was around 1 000 years old when humans first arrived on Madagascar



FANTASTIC MR FOSA

Buoyed by my success with the not-so-elusive mongoose, I travelled north to the deciduous forests of Kirindy in Madagascar's central west, hoping to see fosa breeding behaviour. The fosa (previously spelled 'fossa') *Cryptoprocta ferox* is the largest and most charismatic of the island's carnivores, measuring up to 1.6 metres in length, although half of this is a counterbalancing tail. Close morphological similarities to cats – retractile claws, dental traits, facial resemblance – have led to past comparisons with felids, although it is now clear the fosa attained such traits through convergent evolution.

Outside the breeding season, fosas are mainly nocturnal, secretive and solitary, but when mating (between October and December) they lose their shyness. Females in oestrus may attract the attention of several males simultaneously, which then

stay in close proximity and vie for her affections. She will often sit in a favoured tree and during her fertile period mate with various males, an act that is prolonged and noisy. Because different males compete to fertilise the egg, it is thought that they have evolved disproportionately large penises as a way of implanting their sperm more deeply into the female, thus increasing their chances of biological success.

Within Kirindy Forest there are several known 'mating trees', including one near the research camp. It was late October when I visited and although there had been signs of fosa activity in the area, no mating behaviour had been seen. I scouted a broader area, including other renowned hotspots. A dry riverbed, with one rapidly shrinking pool, provided the location for my first encounter, when I came across a male fosa walking along its course. It was

clear his thirst outweighed any wariness as he boldly approached the water. A group of Verreaux's sifakas, high in trees overlooking the pool, erupted into a cacophony of alarm calls, and then ricocheted through the canopy in the opposite direction.

Over the next few days, I spent most of my time around the mating tree near the camp and saw numerous fosas, including at least three males and one female. But at no time, day or night, did she climb her favoured tree to actually begin mating. The males came and went, constantly investigating the female's whereabouts and activity. They seemed fearless and on several occasions I found myself lying on the forest floor watching an animal wander by within arm's reach. At close range I could see every rippling muscle on their lithe bodies, and it was clear how much power is concentrated in their forelimbs and

that bore a disturbing resemblance to a giant tumour. I later found out that this particular tree is believed to be more than 3000 years old! To put this in perspective, this means it was seeded when the Phoenicians were inventing the alphabet, and was around 1000 years old when humans first arrived on Madagascar.

At one point the fissured, pock-marked limestone opened into a giant chasm and I descended steep, makeshift steps into the blackness of a cave. At the bottom was permanent water, crystal clear with a mirrored surface. Reflections danced on the rough rock ceiling of the cave. Beneath the calm surface of the water, however, there was unexpected activity – small ghost-like wisps of life that hovered and darted around in the pool. Measuring no more than seven centimetres in length and devoid of all cutaneous pigmentation, *Typhleotris madagascariensis* is an endangered blind cave fish that is known only (and barely at that) from the cave systems near Lac Tsimanampetsotsa.

After several hours exploring the area, I'd seen plenty to keep me enthralled – a troop of ring-tailed lemurs picking their way through the arid forest, a distinctive Verreaux's coua calling from inside a dense thicket, flocks of garrulous sickle-billed vangas and numerous lizard species – but I hadn't gained any clues as to where I might find the mongoose. To be fair, so little is understood



about the animal that I didn't have much to go on.

It is thought to sleep during the day in natural cavities beneath the rocks and is known to use specific latrine sites, often on prominent rocks, so I had hoped I might find one of these. But my investigations proved fruitless and I returned to camp to pick up my torches and wait until dark to resume the search.

Remarkably, I didn't have to wait very long. As always in the tropics, darkness fell quickly, and within 10 minutes I had encountered two mongooses intently investigating every nook and cranny between the boulders, tree trunks and stumps just outside the camp. I dropped to my knees in shock, terrified I might scare them away. There was little need to worry, as the mongooses could scarcely have been more confident. They strutted around, with their bushy tails erect, paying no attention to me whatsoever. Above the drone of the nocturnal insect chorus, I could hear their squeaks, chirrups and soft contact calls, which became more intense and amplified when they found something interesting, especially if it was edible. (continued on page 44)

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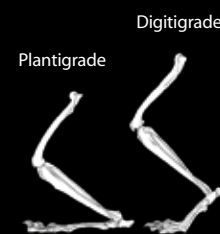
ABOVE The blind cave fish *Typhleotris madagascariensis*, known only from the cave systems adjacent to Lac Tsimanampetsotsa, is easily seen in some subterranean rock pools.

OPPOSITE The fosa is Madagascar's largest carnivore. Males (like this one) are especially powerful and are equally at home hunting lemurs in the forest canopy or various rodents and insectivores on the ground. Normally shy and elusive, they can be more easily seen in some western deciduous forests during their breeding season in October and November.

paws. Their gait is also distinctive:

at a trot, they bounce on their paws; when walking, they slump back on their heels (a digitigrade versus plantigrade gait).

Of course fosas are extremely agile climbers, and equally at home hunting in trees or on the ground. One of their most peculiar and remarkable features is their 'reversible' ankle, which enables them to grasp both sides of a slender tree trunk with their hind feet, either when ascending or descending (headfirst), or leaping to an adjacent trunk.



BEEN THERE, SEEN THAT

In addition to Grandidier's vontsira-fotsy and the fosa, Madagascar has just seven species of native carnivore, but ticking them off your life list isn't as easy as you might think.

1 The secretive **jabady** or **Malagasy civet** *Fossa fossana* is a small, spotted, fox-like carnivore about the size of a domestic cat. It lives in pairs in the eastern rainforests and some deciduous forest in the far north. A pair's territory normally covers around 50 hectares, and is marked with scent from glands around the anus, cheeks and neck.



2 Madagascar's most specialised carnivore is the **fanaloka** or **small-toothed civet** *Eupleres goudotii*. This uncommon and secretive animal lives in marshy areas in the lowland rainforests of the east and north-east and similar swampy areas in some deciduous forests of the north-west. It is larger than the jabady and has an extended snout and tiny teeth – features that help it catch the earthworms that dominate its diet. The claws and muscular forepaws are adapted for digging and are also used for defence. The young are extremely well developed at birth: babies are born with their eyes open and are able to follow their mother and hide in vegetation within two days.

Because of their outward resemblance, the five (now six) smaller species of Malagasy carnivores were previously regarded as an offshoot of the mongoose family. They are now known to be directly related to other members of the Eupleridae, but are placed in a separate 'mongoose-like' subfamily, Galidinae.



3 The most common and widespread species is the **vontsira** or **ring-tailed mongoose** *Galidia elegans*, which is split into three subspecies that inhabit different forest regions. All are diurnal and have a rich russet coat and distinctive banded tail. They are sociable creatures, often found in vocal family groups. Equally at home on the ground or in the branches of trees, they forage for rodents, young birds, eggs, reptiles and invertebrates.



4 The **boky boky** or **narrow-striped mongoose** *Mungotictis decemlineata* is mainly diurnal and is found only in the dry areas of the west. These delightful grey/sandy-coloured animals have several faint dark stripes along their flanks and back and a large bushy tail, which is held erect when alarmed. They forage over large areas, covering up to two kilometres in a day. Their diet is dominated by insects, particularly grubs and larvae that are excavated from rotting wood.

5 Two of Madagascar's least-known carnivores belong to the genus *Galidictis*. The **vontsira-fotsy** or **broad-striped mongoose** *Galidictis fasciata* is a distinctive but enigmatic species from the eastern rainforests that is strictly nocturnal and hardly ever seen. The second is my new best friend **Grandidier's vontsira-fotsy** or the **giant striped mongoose** *Galidictis grandidieri* (pictured).



6 Equally mysterious is the little-known **salano** or **brown-tailed mongoose** *Salanoia concolor* from the north-eastern rainforests. It is known to be terrestrial and active during the day and to feed mostly on insects, especially beetle larvae that are excavated from decomposing wood. Betampona Strict Nature Reserve (which is difficult to visit) is the only location where this species has been seen with any frequency.

7 A new species of carnivore has just been discovered living in the reed beds of Lac Alaotra in eastern Madagascar. A relative of the brown-tailed mongoose *Salanoia concolor*, **Durrell's mongoose** *S. durrelli* has been named in recognition of conservationist and author Gerald Durrell, who did so much to champion the endangered wildlife of the country. In ecology and behaviour, Durrell's mongoose is perhaps most similar to the African marsh mongoose *Atilax paludinosus*. While neither species has webbed feet, both have proportionally larger pads, which help with swimming and walking on floating vegetation.

Little is known about social interactions amongst Grandidier's mongoose. This pair is settling a dispute over food.

TAXING TAXONOMY

Because of the variety in size and shape of Madagascar's endemic carnivores, and the lack of obvious close relatives in other parts of the world (especially mainland Africa), their origins and evolution have caused considerable debate.

In the past it was thought they were related to the civets and genets (family Viverridae) and true mongooses (family Herpestidae). However, the latest genetic research has provided compelling evidence to suggest that all species evolved from a single common ancestor that arrived on the island between 20 and 30 million years ago. Hence, the Malagasy carnivores hail from an ancient lineage with no close living relatives and consequently have been given their own endemic family, Eupleridae.

Further confusion exists over the common names used for these species. In the past they have been based on lamentable misinterpretations of the Malagasy names or the outdated and erroneous assumption that the country's carnivores were members of more widespread families. To try to resolve this confusion there is now a concerted effort to standardise the vernacular names based on Malagasy names.

Shortly afterwards two more appeared, both a little larger than the first two. I wondered if they were the parents of the other mongooses, which had remained close by. It was difficult to keep track of the movements of all four animals in my torch beam as they moved around quickly, apparently combing the area for tasty morsels.

One of the larger animals started to focus on a small rotting tree stump that had fallen over, and I watched as it

scratched and scabbled with obviously strong front claws beneath the log, clearing sand and stones and excavating a substantial hole. Its actions became increasingly frantic as it plunged its muzzle into the cavity and forced its body underneath the wood. Shortly afterwards it reversed with a plump, hissing cockroach in its jaws, which it devoured with gusto. What scant information there is suggests that Grandidier's mongoose feeds largely on invertebrates, but its powerful skull and massive teeth hint at larger prey also being tackled.

For the next few hours I was able to follow and watch the quartet as they foraged in the forest. Although my observations are anecdotal, some elements of their behaviour became more evident. While all four animals remained within the vicinity of one another, at no time did they appear to do anything cooperatively; indeed I saw some disagreements and scuffles, which suggested they were fighting over food. They also seemed very reluctant to climb, except along fallen logs at low heights.

Eventually the mongooses moved on and I decided to leave them alone. But that wasn't the last I saw of them that night. In the small hours I was woken by scratching just outside my tent. Bleary-eyed and still half asleep, I took a moment to realise what was happening. I carefully unzipped the tent to be confronted by two mongooses eagerly investigating my food basket tucked beneath the fly-sheet. One of them had already discovered the open tin of sardines, the other was trying to break into the tub of honey. They ignored me totally.

The intimate encounters continued the following evening too, with increasing audacity. When I sat down to eat in the evening, it was in the company of three mongooses, who were intent on helping themselves to whatever free food they could find. At several junctures I had to shoo them away from my plate, as if batting away annoying insects. This was hardly the way I'd anticipated seeing an endangered species with a ridiculously small world range, whose behaviour and ecology largely remains shrouded in mystery. Madagascar's capacity to confound should never really be a surprise. **AG**

